AMENDMENTS TO THE CLAIMS

Claim 1. (previously presented) A video data compression apparatus, comprising:

indicator data calculating means for calculating indicator data indicating a complexity of video data for every picture from non-compressed video data;

target value calculating means for calculating a target value of an amount of data after compression of said video data for every picture based on said calculated indicator data; and

compressing means for compressing said non-compressed video data in accordance with said calculated target value, wherein said indicator data is calculated based on at least one coefficient between a global complexity and at least one of ME residual data, intra AC data, and flatness data.

Claim 2. (previously presented) A video data compression apparatus according to claim 1, wherein:

said compressing means compresses said non-compressed video data to a picture type sequence containing a plurality of types of pictures (I picture, P picture, and B picture, or a combination of them) in a predetermined order,

said indicator data calculating means calculates the ME residual data for said indicator data of pictures to be compressed to one of a P picture and a B picture and calculates at least one of the flatness data and the intra AC data for said indicator data of a picture to be compressed to an I picture, and

said target value calculating means calculates difficulty data corresponding to the amount of data after compression based on said calculated indicator data and further calculates said target value based on the calculated difficulty data.

Claim 3. (previously presented) A video data compression apparatus according to claim 1, wherein:

said indicator data calculating means calculates an activity for the indicator data for compressing said video data to an I picture.

Claim 4. (previously presented) A video data compression apparatus according to claim 1, further comprising:

delaying means for delaying said video data for a predetermined time and outputting same; wherein

said target value calculating means calculates said target value with respect to an output picture output by said delaying means based on said indicator data calculated during a period where said delaying means delays said video data; and

said compressing means compresses pictures output by said delaying in accordance with said calculated target value.

Claim 5. (previously presented) A data compression method, comprising the steps of:

calculating indicator data indicating a complexity of video data for every picture from non-compressed video data;

calculating a target value of an amount of data after compression of said video data for every picture based on said calculated indicator data; and

compressing said non-compressed video data by a predetermined compression method in accordance with said calculated target value,

wherein said indicator data is calculated based on at least one coefficient between a global complexity and at least one of ME residual data, intra AC data, and flatness data.

Claim 6. (previously presented) A video data compression method according to claim 5, wherein:

said compressing step compresses said non-compressed video data to a picture type sequence containing a plurality of types of pictures (I picture, P picture, and B picture, or a combination of the same) in a predetermined order,

said indicator data calculating step calculates the ME residual data for said indicator data of pictures to be compressed to one of a P picture and a B picture and calculates at least one of the flatness data and the intra AC data for said indicator data of a picture to be compressed to an I picture,

said data amount target value calculating step further has a step for calculating difficulty data corresponding to the amount of data after compression based on said calculated indicator data, and

said target value is calculated based on the calculated difficulty data.

Claim 7. (previously presented) A video data compression method according to claim 5, wherein:

said indicator data calculating step calculates an activity for the indicator data for compressing said video data to an I picture.

Claim 8. (previously presented) A video data compression method according to claim 5, further comprising the step of delaying said video data by a predetermined time and outputting same, wherein

said data amount target value calculating step calculates said target value with respect to an output picture delayed and output based on said indicator data calculated during a period where said video data is delayed, and

said compressing step compresses the output picture in accordance with said calculated target value.

Claim 9. (previously presented) A video data compression apparatus, comprising:

indicator data calculating means for calculating indicator data indicating a complexity of video data for every picture from non-compressed video data;

difficulty data calculating means for performing predetermined computation processing for multiplying a coefficient with said calculated indicator data to calculate difficulty data corresponding to an amount of data after compression of said video data for every picture;

target value calculating means for calculating a target value of the amount of data after compression of said video data for every picture based on said calculated difficulty data;

compressing means for compressing each of the pictures of said non-compressed video data by a predetermined compression method in accordance with said calculated target value so as to generate compressed video data; and

coefficient updating means for updating said coefficient based on the amount of data of the generated compressed video data,

wherein said indicator data is calculated based on at least one of ME residual data, intra AC data, and flatness data of the picture, and

said coefficient is calculated based on a relationship between a global complexity and said at least one of ME residual data, intra AC data, and flatness data.

Claim 10. (previously presented) A video data compression apparatus according to claim 9, wherein:

said compressing means compresses said non-compressed video data to a picture type sequence containing a plurality of types of pictures (I picture, P picture, and B picture, or a combination of the same) in a predetermined order; and

said indicator data calculating means calculates the ME residual date for said indicator data of pictures to be compressed to one of a P picture and a B picture and calculates the flatness data, the intra AC data, and an activity or a combination of the same for said indicator data of a picture to be compressed to an I picture.--

Claim 11. (previously presented) A video data compression apparatus according to claim 10, wherein:

said compressing means has

quantizing means for quantizing said video data by a quantization value set from an external unit so as to generate said compressed video data and

quantizing value adjusting said quantization value based on said calculated target value and setting the same in said quantizing means; and

said coefficient updating mans updates said coefficient based on an average value of said quantization values set in said quantizing means of said compressing means, an amount of data of said generated compressed video data and said calculated indicator data.

Claim 12. (previously presented) A video data compression apparatus according to claim 11, wherein:

said coefficient updating means has:

global complexity calculating means for calculating a global complexity based on the average value of said quantization values set in said quantizing means of said compressing means and the amount of data of said generated compressed video data and

coefficient calculating means for calculating said coefficient based on said calculated global complexity and said indicator data.

Claim 13. (original) A video data compression apparatus according to claim 12, wherein:

said coefficient calculating means divides the global complexity of a picture which becomes an I picture after compression by said generated flatness, intra AC, or activity to calculate said coefficient for an I picture and divides the global complexity of a picture which becomes a P picture or a B picture after compression by said generated ME residual to calculate said coefficient for a P picture and said coefficient for a B picture.

Claim 14. (original) A video data compression apparatus according to claim 13, wherein:

said coefficient calculating means adds or subtracts a predetermined offset value with respect to said global complexity and divides the result by said generated flatness, intra AC, or activity to calculate said coefficient for an I picture and divides the global complexity of a picture which becomes a P picture or a B picture after compression by said generated ME residual to calculate said coefficient for a P picture and said coefficient for a B picture.

Claim 15. (previously presented) A video data compression method, comprising the steps of:

calculating indicator data indicating a complexity of video data for every picture from non-compressed video data;

performing predetermined computation processing for multiplying a coefficient with said calculated indicator data to calculate difficulty data corresponding to an amount of data after compression of said video data for every picture;

calculating a target value of the amount of data after compression of said video data for every picture based on said calculated difficulty data;

compressing each of the pictures of said non-compressed video data by the compression method in accordance with said calculated target value so as to generate compressed video data; and

updating said coefficient based on the amount of data of the generated compressed video data,

wherein said indicator data is calculated based on at least one of ME residual data, intra AC data, and flatness data of the picture, and

said coefficient is calculated based on a relationship between a global complexity and said at least one of ME residual data, intra AC data, and flatness data.

Claim 16. (previously presented) A video data compression method according to claim 15, wherein:

said compressing step compresses said non-compressed video data to a picture type sequence containing a plurality of types of pictures (I picture, P picture, and B picture, or a combination of the same) in a predetermined order; and

said indicator data calculating step calculates the ME residual data for said indicator data of pictures to be compressed to a P picture and B picture and calculates the flatness data, the intra AC data, and activity or a combination of the same for said indicator data of a picture to be compressed to an I picture.

Claim 17. (original) A video data compression method according to claim 16, wherein:

said compressing step further contains

a step of quantizing the video data subjected to said predetermined compression processing by a quantization value set from an external unit so as to generate said compressed video data and

a step of successively adjusting and setting said quantization value based on said calculated target value; and

said updating step updates said coefficient based on an average value of said adjusted and set quantization values, the amount of data of said generated compressed video data, and said calculated indicator data.

Claim 18. (original) A video data compression method according to claim 17, wherein:

said updating step

calculates a global complexity based on the average value of said adjusted and set quantization values and the amount of data of said generated compressed video data and

calculates said coefficient based on said calculated global complexity and said indicator data.

Claim 19. (original) A video data compression method according to claim 18, wherein:

said updating step divides the global complexity of a picture which becomes an I picture after compression by said generated flatness, intra AC, or activity to calculate said coefficient for an I picture and divides the global complexity of a picture which becomes a P picture or a B picture after compression by said generated ME residual to calculate said coefficient for a P picture and said coefficient for a B picture.

Claim 20. (original) A video data compression method according to claim 19, wherein:

said updating step adds or subtracts a predetermined offset value with respect to said global complexity and divides the result by said generated flatness, intra AC, or activity to calculate said coefficient for an I picture and divides the global complexity of a picture which becomes a P picture or a B picture after compression by said generated ME residual to calculate said coefficient for a P picture and said coefficient for a B picture.

Claim 21. (previously presented) A video data compression apparatus for compressing a continuous plurality of video data to compressed video data of a picture type sequence containing a plurality of types of pictures (I picture, P picture, and B picture) in a predetermined order, comprising:

rearranging means for rearranging pictures of said video data to an order adapted to a compression method so that each head picture of said video data becomes one of an I picture and a P picture;

indicator data calculating means for calculating indicator data indicating a complexity of said rearranged video data for every picture;

border detecting means for detecting a scene change of a continuous plurality of said video data;

changing means for changing said picture type sequence so that pictures of any of said video data are compressed without reference to the pictures of said other video data for every border of a detected scene change;

target value calculating means for calculating a target value of an amount of data after compression of said video data based on said calculated indicator data and said picture type sequence after change; and

compressing means for compressing said video data to compressed video data of said picture type sequence after change in accordance with said calculated target value;

wherein said indicator data is calculated based on at least one coefficient between a global complexity and at least one of ME residual data, intra AC data, and flatness data.

Claim 22. (previously presented) A video data compression apparatus according to claim 21, wherein:

said target value calculating means has

approximating means for performing predetermined computation processing for multiplying said at least one coefficient with said corresponding ME residual data, intra AC data, and flatness data of the picture to calculate said indicator data corresponding to the amount of data after compression and

calculating means for calculating a target of the amount of data after compression of said video data for every picture based on said calculated indicator data, and

said compressing means has

quantizing means for quantizing said video data by a quantization value set from an external unit so as to generate said compressed video data and

quantization value adjusting and setting means for successively adjusting said quantization values based on said calculated target value and setting the same in said quantizing means; said video data compression apparatus further comprising

coefficient updating means for updating said coefficient based on the average value of said quantization values set in said quantizing means of said compressing means, the amount of data of said generated compressed video data, and said calculated indicator data.

Claim 23. (previously presented) A video data compression apparatus according to claim 21, wherein

said target value calculating means has:

predictive target amount calculating means for calculating said target value in accordance with the type of picture after compression by predicting that pictures contained in the predetermined compression unit are compressed as an order of said picture type sequence in advance before the change of said picture type sequence and

target amount correcting means for correcting said target value of a picture of said video data of a type of picture which after compression is changed in accordance with the type of the picture after the change in only a case where a change of said picture type sequence actually exists.

Claim 24. (previously presented) A video data compression apparatus according to claim 23, wherein:

said indicator data calculating means calculates the flatness data, the intra AC data, and an activity for the indicator data of a picture which becomes an I picture after compression and the ME residual for the indicator data of a picture which becomes one of a P picture and a B picture after compression;

said changing means changes said picture type sequence so that a picture of a head of said video data is compressed to an I picture when the picture of the head of said video data would be compressed to a P picture; and

said target amount correcting means corrects said target value of a picture of a type of picture after compression which changes from a P picture to an I picture, which is calculated in advance, to said target amount of a picture in a case where it becomes an I picture after compression and corrects said target value of a picture of a type of the picture after compression which changes from an I picture to a P picture, which is calculated in advance, to said target amount of a picture in a case where it becomes a P picture after compression.

Claim 25. (previously presented) A video data compression apparatus according to claim 22, wherein said coefficient updating means has

global complexity calculating means for calculating said global complexity based on an average value of said quantization values set in said quantizing means of said compressing means and the amount of data of said generated compressed video data and

coefficient calculating means for calculating said at least one coefficient based on said calculated global complexity and said at least one of ME residual data, intra AC data, and flatness data.

Claim 26. (previously presented) A video data compression apparatus according to claim 25, wherein:

said coefficient calculating means divides the global complexity of a picture which becomes an I picture after compression by at least one of said flatness data, intra AC data, and an activity to calculate the coefficient for an I picture and divides the global complexity of a picture which becomes one of a P picture and a B picture after compression by said ME residual data to calculate the coefficient for one of a P picture and a B picture.

Claim 27. (previously presented) A video data compression method for compressing a continuous plurality of video data to compressed video data of a picture type sequence containing a plurality of types of pictures (I picture, P picture, and B picture) in a predetermined order, comprising the steps of:

rearranging pictures of said video data to an order adapted to the compression method so that each head picture of said video data becomes one of an I picture and a P picture;

calculating indicator data indicating a complexity of said rearranged video data for every picture;

detecting a scene change of a continuous plurality of said video data;

changing said picture type sequence so that a picture of any of said video data is compressed without reference to a picture of other video data for every border of a detected scene change;

calculating a target value of the amount of data after compression of said video based on said calculated indicator data and said picture type sequence after change; and

compressing said video data to the compressed video data of said picture type sequence after change in accordance with said calculated target value;

wherein said indicator data is calculated based on at least one coefficient between a global complexity and at least one of ME residual data, intra AC data, and flatness data.

Claim 28. (previously presented) A video data compression method according to claim 27, wherein:

said target value calculating step performs predetermined computation processing for multiplying said coefficient with said calculated indicator data so as to calculate difficulty data corresponding to the amount of data after compression and

calculates a target of the amount of data after compression of said video data for every picture based on said calculated difficulty data,

said compressing step quantizes video data subjected to said predetermined compression processing by a quantization value set from an external unit so as to generate said compressed video data and

successively adjusts said quantization value based on said calculated target value and sets the same, and

said predetermined coefficient is updated based on the average value of said set quantization values, the amount of data of said generated compressed video data, and said calculated indicator data.

Claim 29. (original) A video data compression method according to claim 27, wherein:

said target value calculating step calculates said target value in accordance with the type of picture after compression by predicting that pictures contained in said predetermined compression unit are compressed as an order of said picture type sequence in advance before the change of said picture type sequence and

corrects said target value of the picture of said noncompressed video data of a type of picture which after compression is changed in accordance with the type of the picture after the change in only a case where a change of said picture type sequence actually exists.

Claim 30. (previously presented) A video data compression method according to claim 29, wherein:

said indicator data calculating step calculates the flatness data, the intra AC data, and an activity for the indicator data of a picture which becomes an I picture after compression and the ME residual data for the indicator data of a picture which becomes one of a P picture and a B picture after compression;

changes said picture type sequence so that the picture of the head of said video data is compressed to an I picture where the picture of the head of said video data would be compressed to a P picture; and

corrects said target value of a picture of a type of picture after compression which is changed from a P picture to an I picture, which is calculated in the case where it becomes an I picture after compression and corrects said target value of a picture of a type of picture after compression which is changed from an I picture to a P picture, which is calculated in advance, to said target amount of a picture in the case where it becomes a P picture after compression.

Claim 31. (previously presented) A video data compression method according to claim 28, wherein

said coefficient updating step calculates said global complexity based on the average value of said quantization values to be set and the amount of data of said generated compressed video data.

Claim 32. (previously presented) A video data compression method according to claim 31, wherein:

said coefficient calculating step divides the global complexity of a picture which becomes an I picture after compression by one of said flatness data, intra AC data, and an activity to calculate said coefficient for an I picture and divides the global complexity of a picture which becomes one of a P picture and a B picture after compression by said ME residual data to calculate said coefficient for one of a P picture and a B picture.--

Claim 33. (previously presented) Video data encoding apparatus for encoding source video data, the apparatus comprising:

means for calculating difficulty data for every picture of said source video data, wherein said difficulty data indicates a complexity of said picture to be encoded, said difficulty data being calculated based on at least one coefficient between a global complexity and said at least one of ME residual data, intra AC data, and flatness data;

means for calculating target bits for said every picture based on said difficulty data; and

means for encoding said source video data for said every picture in accordance with said target bits to generate encoded video data so that the bits of said encoded video data agree with said target bits.

Claim 34. (previously presented) Video data encoding method for encoding source video data, the method comprising the steps of:

calculating difficulty data for every picture of said source video data, wherein said difficulty data indicates a complexity of said picture to be encoded, said difficulty data being

calculated based on at least one coefficient between a global complexity and said at least one of ME residual data, intra AC data, and flatness data;

calculating target bits for said every picture based on said difficulty data; and

encoding said source video data for said every picture in accordance with said target bits to generate encoded video data so that the bits of said encoded video data agree with said target bits.